CLAIM AMENDMENTS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1 – 15 (canceled).

Claim 16 (previously presented). A method of converting heat into mechanical work, in a cyclic process comprising the following steps:

compressing a working medium while giving off heat;

subsequently bringing the working medium into thermal contact with an ambient environment through a first heat exchanger;

expanding the working medium and thereby obtaining mechanical work;

guiding the working medium through a second heat exchanger disposed inside a rapidly rotating rotor, the rotor including at least one substantially annular gas chamber surrounding the second heat exchanger; and

radially dissipating heat away from the second heat exchanger, through the annular gas chamber and away from an exterior of the gas chamber.

Claim 17 (previously presented). The method according to claim 16, which comprises guiding the working medium through a compressor downstream of the rotor, in a working medium flow direction.

Claim 18 (previously presented). The method according to claim 16, wherein the working medium takes up ambient heat in the first heat exchanger.

Claim 19 (previously presented). The method according to claim 16, which comprises conducting the working medium through the rotor substantially in an axial direction thereof.

Claim 20 (previously presented). The method according to claim 16, wherein a temperature difference is built up in the rotor of at least 100 K.

Claim 21 (previously presented). The method according to claim 20, wherein a temperature difference is built up in the rotor of at least 300 K.

Claim 22 (previously presented). The method according to claim 21, wherein a temperature difference is built up in the rotor of at least 500 K.

Claim 23 (previously presented). The method according to claim 16, which comprises dissipating the heat via cooling ribs on an outside of the rotor.

Claim 24 (previously presented). The method according to claim 16, which comprises dissipating the heat through a third heat exchanger on an outside of the rotor.

Claim 25 (currently amended). An apparatus for converting heat into mechanical work, comprising:

a device for compressing a working medium;

a turbine configured to expand the working medium to obtain mechanical work, said turbine including a first heat exchanger configured to obtain the working medium from the device and to subsequently bring the working medium into thermal contact with an ambient environment; and

a rotor having an axis defining an axial direction;

said rotor including a second heat exchanger disposed therein;

said second heat exchanger configured to conduct ~~through-flow~~ the working medium substantially in the axial direction, having a substantially ring-cylindrical configuration, and being outwardly bounded by a substantially cylindrical wall;

said rotor including a substantially annular gas chamber divided, in a radial direction, into a plurality of ring-cylindrical partial chambers;

said annular gas chamber configured to radially conduct heat away from said second heat exchanger; and

said second heat exchanger being surrounded by said annular gas chamber.

Claim 26 (previously presented). The apparatus according to claim 25, wherein said partial chambers are configured to receive mutually different gases.

Claim 27 (previously presented). The apparatus according to claim 26, which comprises a pressure control device communicating with said ring-cylindrical partial chambers for setting an internal pressure therein.

Claim 28 (previously presented). The apparatus according to claim 27, wherein said pressure control device is disposed in a region of said axis of said rotor.

Claim 29 (previously presented). The apparatus according to claim 25, which comprises cylindrical separating walls separating said ring-cylindrical partial chambers from one another.

Claim 30 (currently amended). The apparatus according to claim 25, wherein the working medium is fed in and discharged, respectively, through shafts of said rotor.

Claim 31 (previously presented). The apparatus according to claim 25, which comprises a housing with magnets disposed to hold said rotor in said housing by exerting an inwardly directed magnetic force on a circumference of said rotor.

Claim 32 (previously presented). The apparatus according to claim 25, wherein said gas chamber is subdivided in the radial direction into at least three ring-cylindrical partial chambers.

Claim 33 (previously presented). The apparatus according to claim 25, wherein said gas chamber is subdivided in the radial direction into at least four ring-cylindrical partial chambers.

Claim 34 (new). The apparatus according to claim 25, wherein said first heat exchanger is configured to isothermally expand the working medium.

Claim 35 (new). The method according to claim 16, which comprises isothermally expanding the working medium while performing the step of subsequently bringing the working medium into thermal contact with the ambient environment.